

PICTURES TAKEN AT
THE 1968 BROOKHAVEN SUMMER STUDY ON
SUPERCONDUCTING DEVICES AND ACCELERATORS

JUNE 10 - JULY 19, 1968

BROOKHAVEN NATIONAL LABORATORY
ASSOCIATED UNIVERSITIES, INC.
UPTON, NEW YORK

FIRST WEEK - SUPERCONDUCTING RF CAVITIES AND LINACS

Chairman: H.A. SCHWETTMAN, Stanford University

The Summer Study began with a week on applications of superconducting surfaces at radio frequencies. Under the able leadership of Alan Schwettman, an easy and informal atmosphere was rapidly achieved and soon a free and vigorous interchange of information was in progress between exponents of various techniques and representatives of the manufacturers whose technology will be essential to progress in this field. The session was dominated by the energetic Stanford group who continually amazed the audience with the scope and daring of their plans.



Chairman H. Alan Schwettman with W.M. Fairbank and E. Jones, all of Stanford.

G.A. Loew and R.B. Neal of SLAC. In the background is H.J. Halama of Brookhaven.



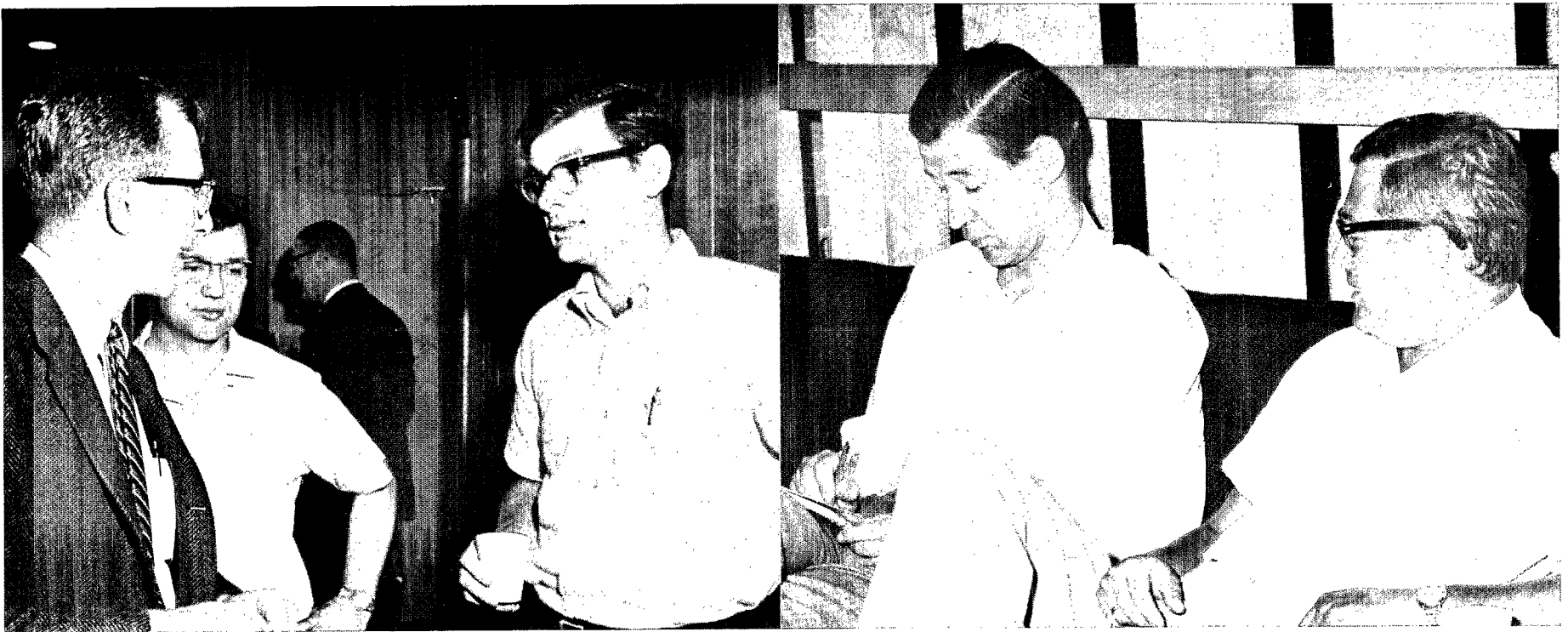
UPPER LEFT: J.P. Blewett of Brookhaven in a discussion with I. Weissman of Varian. UPPER RIGHT: J.E. Leiss of the Bureau of Standards in Washington with A.O. Hanson of the University of Illinois. LOWER LEFT: D. Leroy and

D. Gorié of CERN with C.R. Haden of the University of Oklahoma. LOWER RIGHT: A. Carne of the Rutherford Laboratory makes a point with H.J. Halama of Brookhaven.

SECOND WEEK - CRYOGENICS

Chairman: T.R. STROBRIDGE, NBS, Boulder

A comprehensive survey of the esoteric mysteries of the field of cryogenics was arranged by Dick Strobridge. Enormously valuable papers were presented by Hurlich of General Dynamics and Mowers of Rocketdyne on the properties of materials at low temperatures; these papers will save many of us from making costly and dangerous mistakes. Papers on refrigeration and cryostat design provided a fine survey of the state of the art and of the directions in which further progress can be expected.



LEFT: Chairman T.R. Strobridge with W.H. Bergmann of Argonne and H.A. Schwettman of Stanford.

RIGHT: Two participants from European industry: G. Prast of Philips and G. Bogner of Siemens.



UPPER LEFT: H.M. Long and J. Notaro, both of Union Carbide, Linde Division, in Tonawanda, N.Y. **UPPER RIGHT:** In the foreground, B. Kirk of Air Reduction and J.L. Perry of 500 Inc.; in the background R. Jankowicz of the Princeton-Penn Accelerator and P. Chritchlow of Air Reduction. **LOWER**

LEFT: H. Kautsky of the Princeton-Penn Accelerator exchanging information with C.J. Kruse of SLAC. **LOWER RIGHT:** C.D. Henning of LRL, Livermore, with C.J. Walker of Air Reduction and G.K. Green, Chairman of Brookhaven's Accelerator Department.

THIRD WEEK - SUPERCONDUCTING MATERIALS

Chairman: A. PASKIN, Brookhaven National Laboratory

Arthur Paskin arranged this week as a survey of presently available superconducting materials and a look into the future. Particularly interesting were two "Manufacturer-User round-tables," in which opinions were exchanged about what would be desirable in the realm of superconducting materials. The voice of common sense came from the representatives of industry who explained which user hopes were reasonable and which were not. Unfortunately for those who were not present, these sessions were not recorded; it had been agreed early in the Study that, in the interests of free discussion, nothing would be published that was not submitted to the Editors in writing.



Chairman Arthur Paskin listening to one of the presentations.



R.B. Britton of Brookhaven with H. Laquer of Los Alamos.



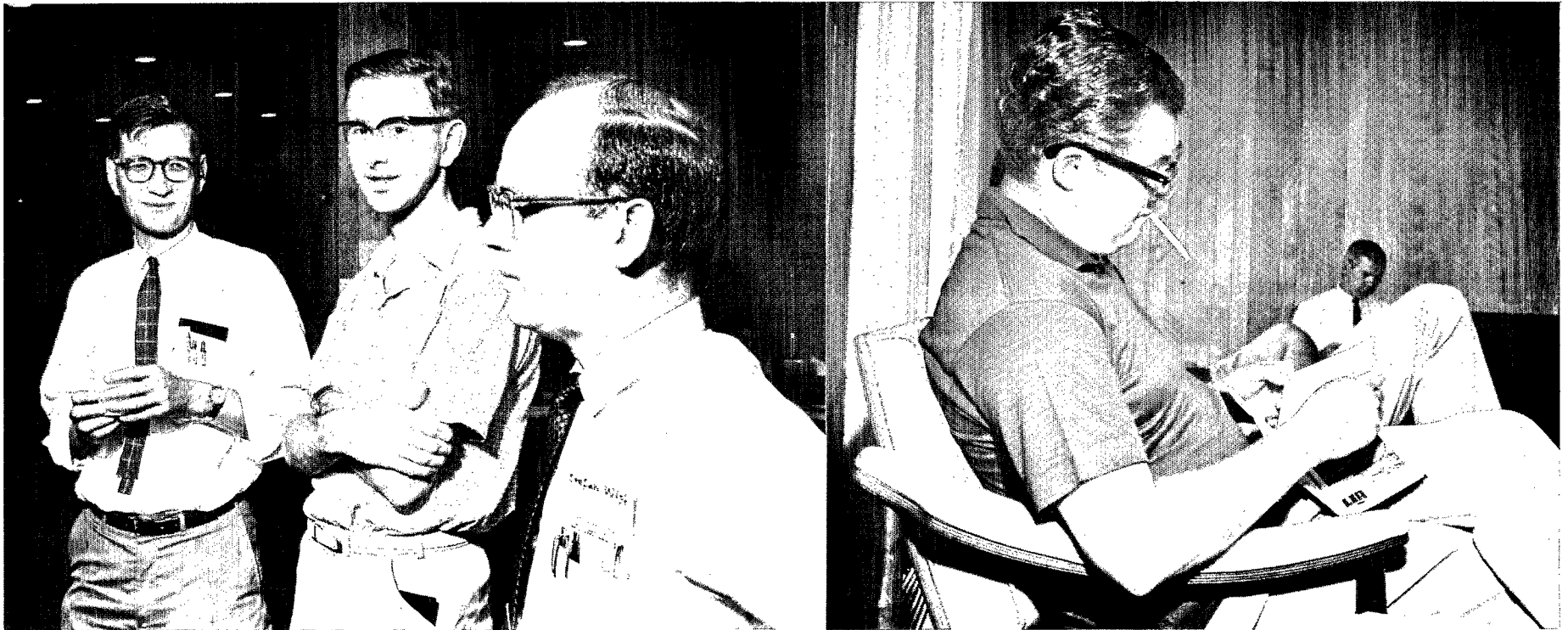
UPPER LEFT: M. Strongin of Brookhaven discussing a point with J.D. Livingston of G.E. **UPPER RIGHT:** J.R. Hale and Y. Iwasa of the Francis Bitter National Magnet Laboratory in Cambridge, Mass. **LOWER LEFT:** Sharing a coffee break – H. Brechna of SLAC, J.M. Rayroux of Oerlikon

in Zurich, Switzerland, and W.F. Gauster of Oak Ridge. **LOWER RIGHT:** One of the many informal "round-tables" – W.V. Hassenzahl (LASL), Y. Iwasa, J.M. Rayroux, H. Brechna, H. Laquer, and C.D. Graham and D.W. Lillie of G.E.

FOURTH WEEK – AC EFFECTS AND FLUX PUMPS

Chairman: S.L. WIPF, Atomics International

Although the Fourth of July cut this week to three days, Stefan Wipf compressed into this period not only a brilliant survey of the problems of instabilities and ac effects in superconductors, but also a half-day review of the status of flux pumps. Particularly notable in the first category were the review papers by Hart of General Electric and by Chairman Wipf. Some very imaginative ideas in the field of superconducting transmission systems were outlined by Nahman of the Bureau of Standards who thinks not only of transmitting power but also of transmission in the same system of information and of cryogenic liquids.



C.D. Graham of G.E. and R. Hancox of the Culham Laboratory with Chairman S.L. Wipf.



G. Bogner of Siemens, Erlangen. In the background is R.L. Rhodenizer of G.E.



UPPER LEFT: M. Foss of the Carnegie Institute of Technology in a discussion with W.T. Beall of the Union Carbide Speedway Laboratories in Indianapolis. **UPPER RIGHT:** Waiting for the morning session to start – H. Brechna of SLAC, with R.L. Rhodenizer of G.E. in the background. **LOWER LEFT:** N.S.

Nahman and W.D. McCaa of the National Bureau of Standards in Boulder check in at the registration desk. **LOWER RIGHT:** R.L. Rhodenizer and G.W. Donaldson of G.E. Mr. Donaldson was on leave from the University of New South Wales in Sydney, Australia.

FIFTH WEEK - SUPERCONDUCTING MAGNETS

Chairman: W.B. SAMPSON, Brookhaven National Laboratory

Bill Sampson's week on superconducting magnets was the most popular of the Summer Study. Superconducting magnets were described, from the huge affairs under construction for large bubble chambers to miniature units suitable for transport of particle beams. It was during this week that Peter Smith of the Rutherford Laboratory brought forward his suggestions for stabilizing superconducting magnets and for reducing ac losses. These ideas already have inspired programs in a number of laboratories; thus far Smith appears to have been correct in all of his predictions.



LEFT: Chairman W.B. Sampson with P.F. Smith of the Rutherford Laboratory. RIGHT: M. Morpurgo of CERN discusses a point with D. Bruce Montgomery of the Francis Bitter National Magnet Laboratory.



UPPER LEFT: A. Asner of CERN and D.N. Cornish of the Culham Laboratory reported on the CERN-Culham co-operative effort on a CERN superconducting quadrupole. **UPPER RIGHT:** P. Lazeyras and R. Wittgenstein of CERN; R.B. Meuser of LRL, Berkeley. **LOWER LEFT:** D. Bruce Montgomery of the National Magnet Laboratory and C.N. Whetstone of Cryomagnetics

exchange information; in the background are M. Morpurgo of CERN and H.M. Long of Union Carbide. **LOWER RIGHT:** J.D. Lawson of the Rutherford Laboratory, J. Alcorn of SLAC, R.B. Meuser of LRL, Berkeley, M. Snowdon of the Rutherford Laboratory listen to a point being made by J.P. Blewett of Brookhaven at a party given by Brookhaven's Director.

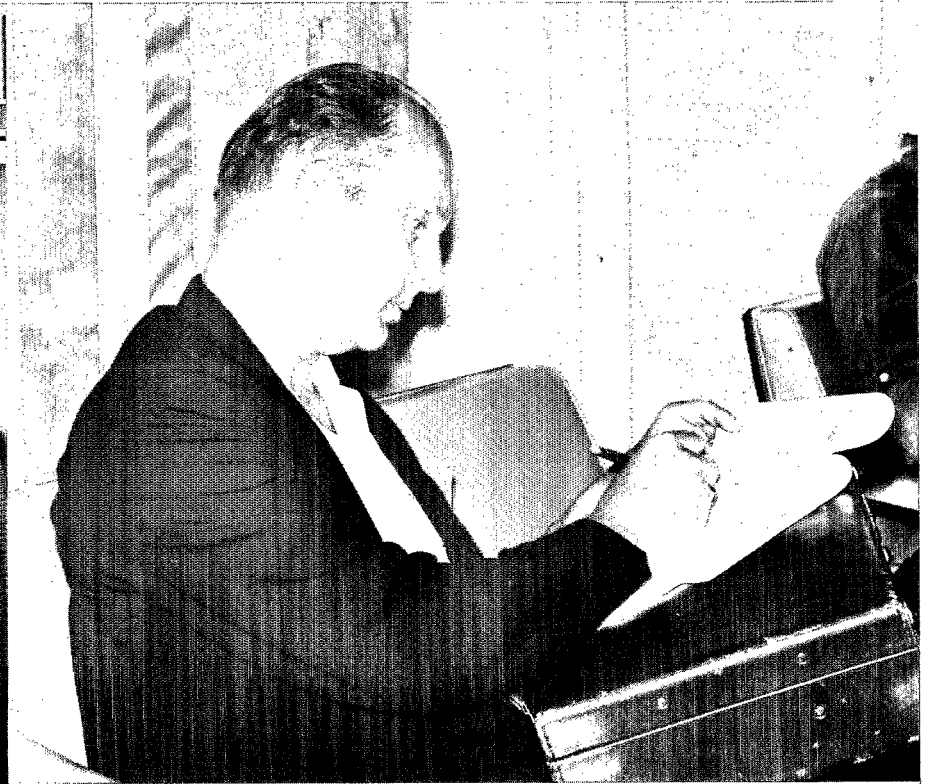
SIXTH WEEK - ACCELERATORS AND STORAGE RINGS USING SUPERCONDUCTING OR CRYOGENIC MAGNETS

Chairman: J.P. BLEWETT, Brookhaven National Laboratory

The final week of the Summer Study, under John Blewett, was a speculative survey of the probable impact of superconducting magnets on the accelerator field. The atmosphere was generally confident and optimistic; superconducting accelerators are surely just over the horizon. A day during this week was devoted to an allied field, the use of pure, but not superconducting, metals at cryogenic temperatures. Here also the prospects appear to be bright. Finally, on the last day of the Study, the chairmen of all of the week-long sessions presented summaries of their weeks. The Study closed amid expressions of mutual admiration and self-satisfaction.



P. Gerald Kruger of the University of Illinois with D.D. Jacobus of Brookhaven.



W.C. Gough of the U.S. Atomic Energy Commission.



UPPER LEFT: W.S. Gilbert of LRL, Berkeley, preparing his presentation.
UPPER RIGHT: M.A. Green of LRL, Berkeley, with C.J. Walker of Air Reduction.
LOWER LEFT: A. Citron of Karlsruhe and Richard A. Beth of Brookhaven.
LOWER RIGHT: Much discussion was held during the coffee breaks. Here are

W.B. Sampson of Brookhaven talking with P.F. Smith of the Rutherford Laboratory (with back to the camera) while A.D. McInturff and K.E. Robins of Brookhaven listen in.